The Evolution and Self Assembly of Quantum Dots

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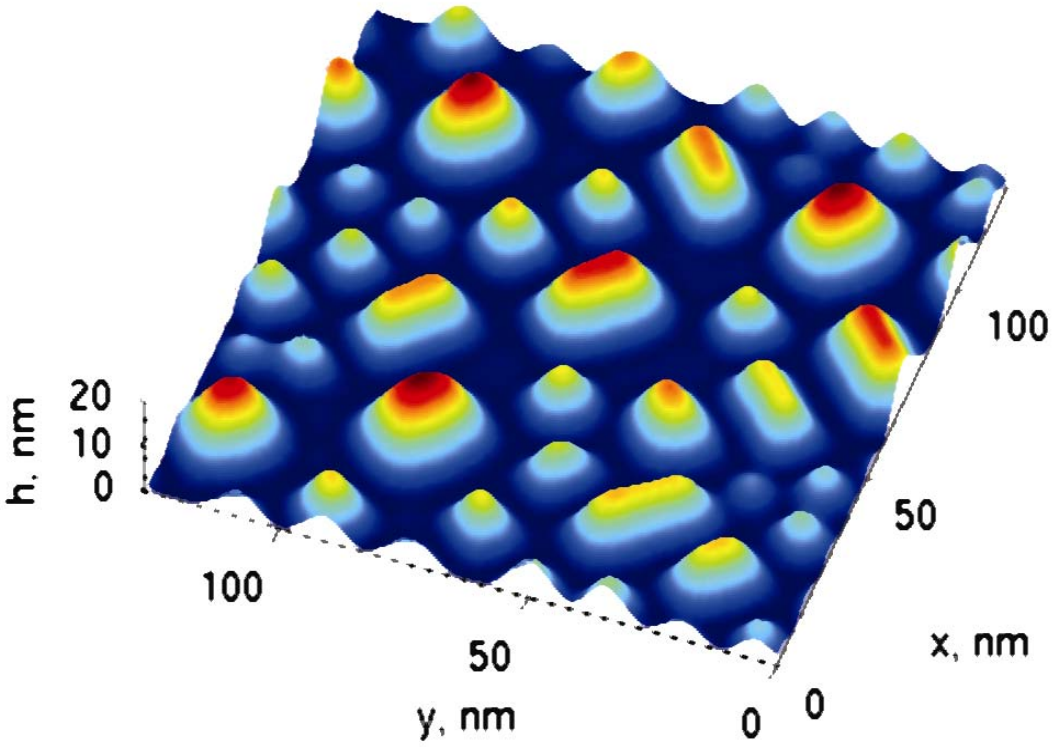
The formation of quantum dots on surfaces is a very promising area of nanotechnology that can lead to a new generation of electronic devices. We proposed a new route to the formation of quantum dots that, unlike the traditional mechanism, does not depend upon the elastic stress generated by the difference in the dot-substrate lattice parameter. The dots form as a result of strongly anisotropic surface energy and a wetting interaction between the film and the substrate. The result of a simulation of dot formation due to this mechanism is shown on the right.



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Education:

Undergraduates (Dan Cogswell, Charles Moore), Graduate students (Matthew Beck, Mihaela Blanariu, Wondimu Tekalign), Postdoctoral Fellows (Tanya Savin and Oleg Shklyaev). During the Spring of 2003, Miksis taught the Honors Engineering Analysis IV Class at Northwestern University. This is a required class of all undergraduate students in the engineering school. The first lab assignment during this Spring quarter involved an investigation of an anisotropic crystal interface. These anisotropic crystals are at the center of our NIRT research and the idea for this lab arose because of this work.

Outreach:

Asta was co-organizer (together with Profs. Zi-Kui Liu and L.Q. Chen of Penn State) of a symposium on materials education held at the annual TMS meeting in March, 2003. The title of the symposium was *Computational Methods in Materials Education* and was sponsored by the Education Committee of the TMS. The symposium brought together participants in industry, national labs and academia to discuss current and new courses in the area of computational materials science, as well as improvements to more traditional materials curricula brought about through use of computational methods.